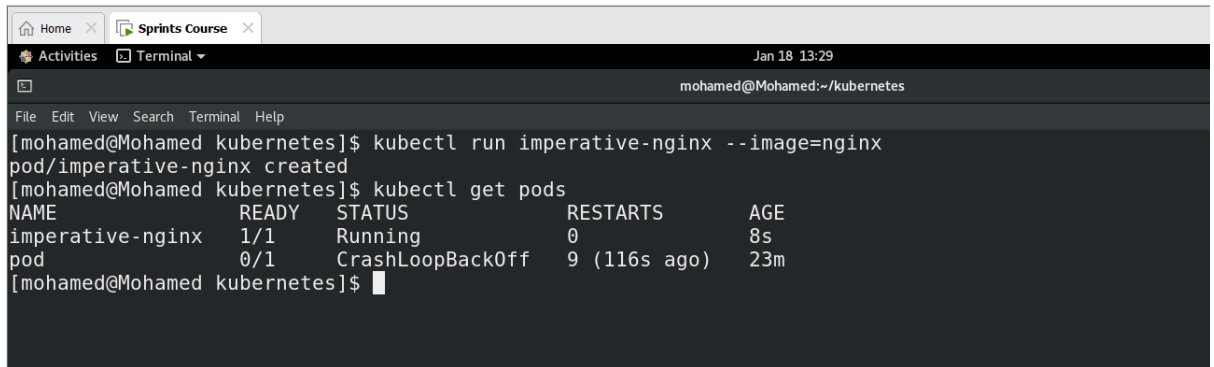


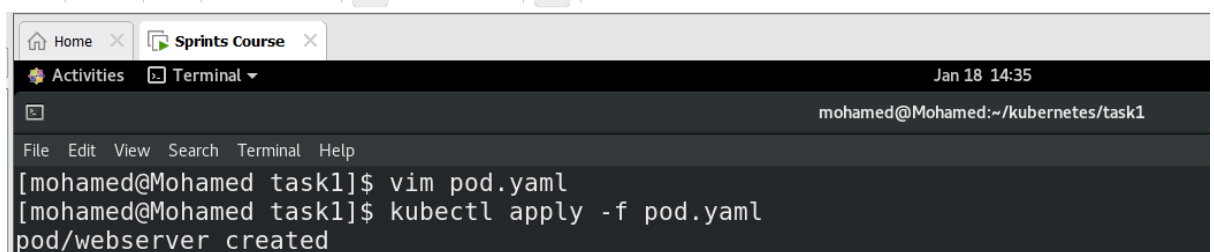
## Kubernetes Lab 1

1) Create a pod with the name “imperative-nginx” and with the image nginx and latest tag. using Imperative command (not yaml).

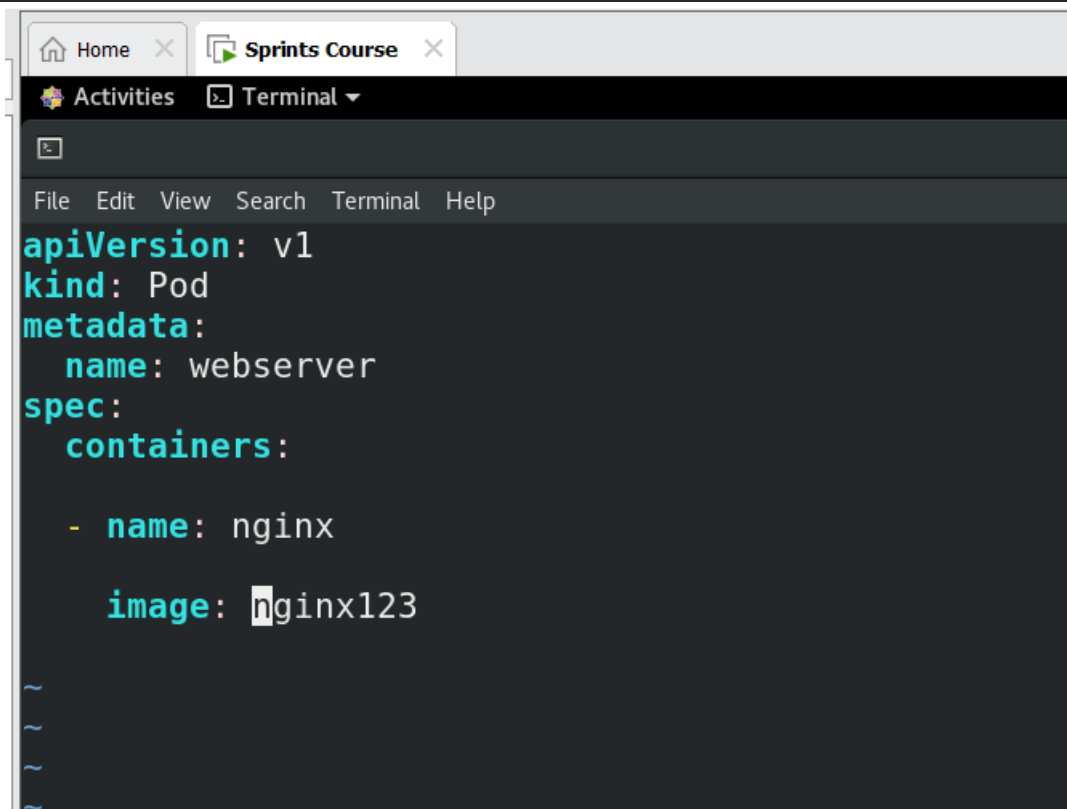


```
[mohamed@Mohamed kubernetes]$ kubectl run imperative-nginx --image=nginx
pod/imperative-nginx created
[mohamed@Mohamed kubernetes]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
imperative-nginx    1/1     Running   0           8s
pod                  0/1     CrashLoopBackOff   9 (116s ago)  23m
[mohamed@Mohamed kubernetes]$
```

2) Create a pod with the name webserver and with the image “nginx123” Use a pod-definition YAML file.



```
[mohamed@Mohamed task1]$ vim pod.yaml
[mohamed@Mohamed task1]$ kubectl apply -f pod.yaml
pod/webserver created
```

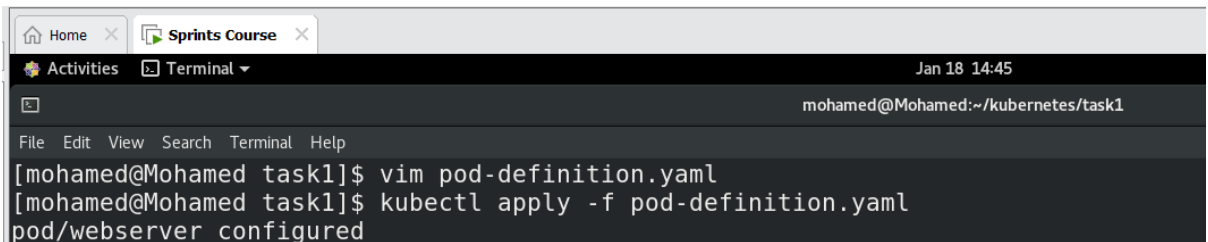


```
apiVersion: v1
kind: Pod
metadata:
  name: webserver
spec:
  containers:
  - name: nginx
    image: nginx123
~
~
~
~
```

3) What is the nginx pod status?

```
[mohamed@Mohamed task1]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
imperative-nginx    1/1     Running   0           66m
webserver            0/1     ErrImagePull 0           3s
[mohamed@Mohamed task1]$
```

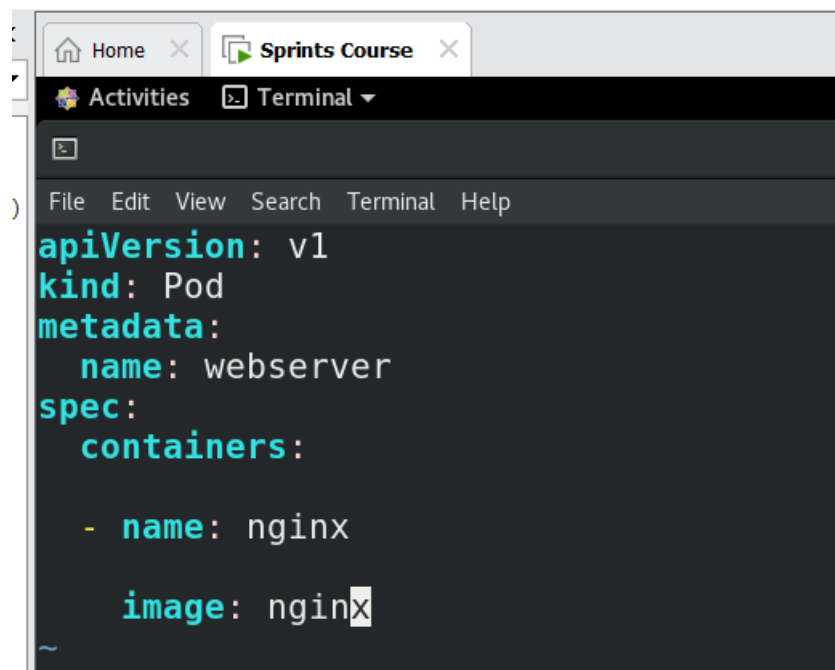
4) Change the nginx pod image to “nginx” check the status again



```

Sprints Course
Jan 18 14:45
mohamed@Mohamed:~/kubernetes/task1
File Edit View Search Terminal Help
[mohamed@Mohamed task1]$ vim pod-definition.yaml
[mohamed@Mohamed task1]$ kubectl apply -f pod-definition.yaml
pod/webserver configured

```



```

Sprints Course
File Edit View Search Terminal Help
apiVersion: v1
kind: Pod
metadata:
  name: webserver
spec:
  containers:
  - name: nginx
    image: nginx

```

5) How many pods are running in the system? Type the command to show this

```
[mohamed@Mohamed task1]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
imperative-nginx    1/1     Running   0           76m
webserver            1/1     Running   0           10m
[mohamed@Mohamed task1]$
```

6) What does READY column in the output of get pods command indicate?

>> It shows how many containers in a pod are considered ready.

7) Delete first pod named imperative-nginx you just created. Type the command to do this

```
mohamed@Mohamed:~/kubernetes/task1
File Edit View Search Terminal Help
[mohamed@Mohamed task1]$ kubectl delete pod imperative-nginx
pod "imperative-nginx" deleted
[mohamed@Mohamed task1]$
```

8) Which node is pod named webserver running on (list two commands to do this)

```
Activities Terminal Jan 18 14:57
mohamed@Mohamed:~/kubernetes/task1
File Edit View Search Terminal Help
[mohamed@Mohamed task1]$ kubectl get pod -o wide
NAME      READY   STATUS    RESTARTS   AGE   IP        NODE     NOMINATED NODE   READINESS GATES
webserver 1/1     Running   0           21m   172.17.0.3 minikube <none>         <none>
[mohamed@Mohamed task1]$

[mohamed@Mohamed task1]$ kubectl describe pod webserver
Name:      webserver
Namespace: default
Priority:   0
Service Account: default
Node:      minikube/192.168.49.2
Start Time: Wed, 18 Jan 2023 14:35:43 +0200
Labels:    <none>
Annotations: <none>
Status:    Running
IP:        172.17.0.3
```

9) Get a shell to the running container i.e. ssh into it (figure out the command)

```
mohamed@Mohamed:~/kubernetes/task1
File Edit View Search Terminal Help
[mohamed@Mohamed task1]$ kubectl exec -it webserver /bin/bash
kubectl exec [POD] [COMMAND] is DEPRECATED and will be removed in a future version. Use kubectl exec [POD] -- [COMMAND] instead.
root@webserver:/#
```

10) Run cat /etc/os-release inside the container

```
root@webserver:/# cat /etc/os-release
PRETTY_NAME="Debian GNU/Linux 11 (bullseye)"
NAME="Debian GNU/Linux"
VERSION_ID="11"
VERSION="11 (bullseye)"
VERSION_CODENAME=bullseye
ID=debian
HOME_URL="https://www.debian.org/"
SUPPORT_URL="https://www.debian.org/support"
BUG_REPORT_URL="https://bugs.debian.org/"
root@webserver:/#
```

11) Exit from the shell (/bin/bash) session

```
root@webserver:/# exit
exit
[mohamed@Mohamed task1]$
```

12) Get logs of pod, what are logs and what they are used for?

>> Application logs can help you understand what is happening inside your application. The logs are particularly useful for debugging problems and monitoring cluster activity.

```
File Edit View Search Terminal Help
[mohamed@Mohamed task1]$ kubectl logs webserver
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2023/01/18 12:44:54 [notice] 1#1: using the "epoll" event method
2023/01/18 12:44:54 [notice] 1#1: nginx/1.23.3
2023/01/18 12:44:54 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2023/01/18 12:44:54 [notice] 1#1: OS: Linux 4.18.0-408.el8.x86_64
2023/01/18 12:44:54 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2023/01/18 12:44:54 [notice] 1#1: start worker processes
2023/01/18 12:44:54 [notice] 1#1: start worker process 29
2023/01/18 12:44:54 [notice] 1#1: start worker process 30
[mohamed@Mohamed task1]$
```

13) How many ReplicaSets exist on the system?

```
File Edit View Search Terminal Help
[mohamed@Mohamed task1]$ kubectl get replicaset
No resources found in default namespace.
[mohamed@Mohamed task1]$
```

14) create a ReplicaSet with name= replica-set-1 / image= busybox / replicas= 3

```
File Edit View Search Terminal Help
mohamed@Mohamed:~/kubernetes/task1
[mohamed@Mohamed task1]$ vim replicaset.yaml
[mohamed@Mohamed task1]$ kubectl apply -f replicaset.yaml
replicaset.apps/replica-set-1 created
[mohamed@Mohamed task1]$ kubectl get rs
NAME                DESIRED    CURRENT    READY    AGE
replica-set-1       3          3          3        87s
[mohamed@Mohamed task1]$ kubectl get pods
NAME                READY    STATUS    RESTARTS    AGE
replica-set-1-db6jg 1/1      Running   0            93s
replica-set-1-qvx4t 1/1      Running   0            93s
replica-set-1-vt5ht 1/1      Running   0            93s
webserver           1/1      Running   1 (6h16m ago) 7h26m
[mohamed@Mohamed task1]$
```

```

File Edit View Search Terminal Help
apiVersion: apps/v1
kind: ReplicaSet
metadata:
  name: replica-set-1
  labels:
    app: guestbook
    tier: frontend
spec:
  replicas: 3
  selector:
    matchLabels:
      tier: frontend
  template:
    metadata:
      labels:
        tier: frontend
    spec:
      containers:
        - name: busybox
          image: busybox
          command: ["/bin/sh"]
          args: ["-c", "sleep 1000"]
~

```

15 ) Scale the ReplicaSet replica-set-1 to 5 PODs

```

[mohamed@Mohamed task1]$ kubectl scale --replicas=5 -f replicaset.yaml
replicaset.apps/replica-set-1 scaled

```

16) How many PODs are READY in the replica-set-1?

```

[mohamed@Mohamed task1]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
replica-set-1-7zhrx  1/1     Running   0           12s
replica-set-1-db6jg  1/1     Running   0           4m6s
replica-set-1-qvx4t  1/1     Running   0           4m6s
replica-set-1-rvwvv  1/1     Running   0           12s
replica-set-1-vt5ht  1/1     Running   0           4m6s
webserver            1/1     Running   1 (6h19m ago)  7h29m
[mohamed@Mohamed task1]$

```

17) Delete any one of the 5 PODs then check How many PODs exist now? Why are there still 5 PODs, even after you deleted one

>>A ReplicaSet's purpose is to maintain a stable set of replica Pods running at any given time even after deleting. As such, it is often used to guarantee the availability of a specified number of identical Pods.

```

[mohamed@Mohamed task1]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
replica-set-1-7zhrx 1/1     Running   0           45s
replica-set-1-db6jg 1/1     Running   0           4m39s
replica-set-1-qvx4t 1/1     Running   0           4m39s
replica-set-1-rvwwv 1/1     Running   0           45s
replica-set-1-vt5ht 1/1     Running   0           4m39s
webserver            1/1     Running   1 (6h19m ago) 7h29m
[mohamed@Mohamed task1]$ kubectl delete pod replica-set-1-7zhrx
pod "replica-set-1-7zhrx" deleted
[mohamed@Mohamed task1]$ kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
replica-set-1-db6jg 1/1     Running   0           13m
replica-set-1-qvx4t 1/1     Running   0           13m
replica-set-1-rvwwv 1/1     Running   0           9m16s
replica-set-1-vt5ht 1/1     Running   0           13m
replica-set-1-zgv4k 1/1     Running   0           88s
webserver            1/1     Running   1 (6h28m ago) 7h38m
[mohamed@Mohamed task1]$ █

```